CLAIMS:

1. A method of making a genetically transformed plant comprising:

A) introducing into a plant cell capable of being transformed and regenerated to a whole plant a DNA expression cassette comprising, in addition to DNA sequences required for transformation and selection in plant cells, a DNA sequence that, under the control of a promoter active in plant cells, encodes a protein capable of modifying the utilization of a substrate in a secondary metabolic pathway, with the proviso that the substrate is not a primary metabolite of the group selected from glucose, amino acids, common fatty acids and nucleotides, and

B) recovering a plant which has an altered content of at least one product of the secondary metabolic pathway.

2. A method for making a genetically transformed seed comprising growing the plant obtained according to steps A and B of the method according to claim 1 under conditions which permit the formation of seed.

3. The method according to claim 1 wherein the promoter is tissue selective.

4. The method according to claim 3 wherein the promoter is seed selective.

5. The method according to claim 1 wherein the product of the secondary metabolic pathway is an anti-nutritional.

6. The method according to claim 1 wherein the protein is a heterologous enzyme.

7. The method according to claim 1 wherein the encoded protein is an enzyme capable of altering a substrate in the phenylpropanoid pathway whereby at least one product of the phenylpropanoid pathway is altered.

8. The method according to claim 4 wherein the encoded protein is an enzyme capable of altering a substrate in the phenylpropanoid pathway whereby at least one product of the phenylpropanoid pathway is altered.

9. The method according to claim 7 wherein the encoded protein is a choline metabolizing enzyme capable of acting upon choline to modify the use of choline by other enzymes in the phenylpropanoid pathway.

10. The method according to claim 9 wherein the choline metabolizing enzyme is choline oxidase, and wherein the choline oxidase encoding DNA sequence is under the control of a seed-selective promoter active in plant cells, and wherein the DNA expression cassette additionally comprises a DNA sequence that encodes betaine aldehyde dehydrogenase capable of acting

upon betaine aldehyde converting it to betaine, said betaine aldehyde dehydrogenase encoding DNA sequence being under the control of a seed-selective promoter active in plant cells.

11. The method according to claim 7 wherein the encoded protein is ferulic acid decarboxylase.

12. The method according to claim 1 wherein the encoded protein is an enzyme capable of acting upon a sugar alcohol.

13. The method according to claim 4 wherein the encoded protein is an enzyme capable of acting upon a sugar alcohol.

14. The method according to claim 12 wherein the encoded protein is an enzyme capable of acting upon myo-inositol.

15. The method according to claim 4 wherein said seed selective promoter is selected from the phaseolin promoter and the napin promoter.

16. A genetically modified plant seed with reduced sinapine content prepared according to the method of claim 8.

17. A genetically modified plant seed with altered phenolic content prepared according to the method of claim 13.

18. A genetically modified plant with altered lignin content prepared according to the method of claim 7.

19. A genetically modified plant seed with altered sugar alcohol content prepared according to the method of claim 13.

20. A genetically modified plant seed with reduced phytate content prepared according to the method of claim 13.

21. DNA vector pHS 731.

22. DNA vector pHS 981.

23. DNA vector pGS97b1.

24. DNA vector pSIMT.

25. DNA vector pNIMT.

26. A DNA vector containing a gene selected from the COX gene, the BADH gene, the IMT gene and the ferulic acid

decarboxylase gene, under the control of the phaseolin promoter.

27. A plant prepared by the method of claim 1, wherein the plant is selected from *Dicotyledoneae* and *Monocotyledoneae*.

28. A plant prepared by the method of claim 1, wherein said plant is selected from members of the families *Malvaceae, Linaceae, Compositae, Fabaceae, Euphorbiaceae, Gramineae* and *Oleaceae*.

29. A plant prepared by the method of claim 1, wherein said plant is a member of the family *Brassicaceae (= Cruciferae)*.

30. A plant prepared by the method of claim 1, wherein said plant is selected from members of the genus *Linum, Gossypium, Glycine, Arachis, Carthamus, Helianthus, Medicago, Sinapis, Raphanus, Ricinus, Olea, Zea, Hordium, Triticale,* and *Oryza*.

31. A plant prepared by the method of claim 1, wherein said plant is a member of the genus *Brassica*.

32. A plant prepared by the method of claim 1, wherein said plant is Brassica *napus* or *Brassica rapa*.

33. A feed product comprising seed or meal derived therefrom wherein the seed is prepared according to the method of claim 4.

add B4

add A1

Add D1